# BRIEFER ARTICLES.

**Synchytrium on Stellaria media.** (WITH PLATE XXVIII.)—Since Farlow and Seymour's Provisional Host-Index of the Fungi of the United States does not report Synchytrium on any species of Stellaria, it is possible that its occurrence upon *Stellaria media* Smith, in the vicinity of Baton Rouge, La., may be of interest to mycologists in this country.

Stellaria media is one of the most common weeds in and around Baton Rouge, and as early as the middle of January of the present year plants growing in low wet places were attacked by the fungus. The presence of the Synchytrium is first indicated to the naked eye by the appearance upon the host of blister-like swellings, each of which, a little later, shows in its center one or more bright yellow spots which, as the fungus matures, change to a reddish brown. The diseased areas show marked hypertrophy (figs. 1 and 2), and the cells of the host are deprived of their chlorophyll and finally of their entire protoplasmic contents. The lower internodes of the stem and the petioles and midribs of the leaves are favorite areas of attack, but if damp weather favors the development of the fungus, no aerial part of the host escapes, and the disease spreads to leaf-blades, pedicels of the flowers, calyx leaves, petals and even to stamens and pistils, everywhere swelling and distorting the tissue, dwarfing the growth and finally killing the plant.

A cross section of the stem where the spots in the pustules have turned reddish brown shows numerous resting-spores occupying cavities that are apparently much enlarged epidermal cells (figs. 1, 3, 4). The normal number of resting-spores in each cavity is one, though quite frequently two and even three are found, in which case they are usually somewhat reduced in size. The upper wall of the epidermal cell in which the spore forms becomes quite thin and often breaks and disappears entirely (figs. 3 and 5).

The resting-spores are spherical, thick-walled, reddish brown in color, with surfaces roughened by a deposit of coarse, irregularly shaped granules. Within this outer granular coat is a thick, darker brown, more compact layer; this has not the homogeneous appearance of most cell walls, but seen in section shows numerous thin, overlapping laminæ, no single one of which can be traced continuously around the circumference of the spore. Within the laminated coat is a colorless, rather delicate membrane enclosing a dark, granular substance

that carries in it many oil globules (fig. 4). The resting-spores show considerable variation in size, and differ noticeably in the roughness of the outer surface.

Along with the resting-spores, though in separate cavities, are occasionally found sori composed of a varying number of angular, polyhedral sporangia enclosed in a delicate, transparent sac (figs. 6 and 7). Each sporangium has a thin, colorless wall and finely granular contents that are colorless when the sporangium is first formed, but change to a bright yellow as it matures.

A section through a leaf or stem where the disease is in its earlier stages shows many of the epidermal cells slightly enlarged and occupied by almost transparent spores that range in size from extremely small spheres to that of the average mature resting-spore. Now these may be early stages of either resting-spores or sori, but since in older diseased tissue, resting-spores are many times more numerous than sori, it seems probable that most of the immature bodies are resting-spores in process of formation (fig. 8).

The size of the resting-spores and their rough, reddish-brown covering agree with the description of *Synchytrium Stellariæ* Fuckel as given by Schroeter[1] and Fischer,[2] as do also the size of the sori and the variable number of sporangia. The host, too, is the same. The contents of the sporangia, however, are bright yellow instead of orange-red, but it is possible that those examined were not yet mature.

Schroeter states that in the same cavity with the sorus and lying just above it, is always found an empty membrane. He explains this as the original wall formed around the swarm-spore after it enters the epidermal cell of the host, and out of which, through an opening at its lower pole, the contents pass when ready to form a sorus. De Bary[3] mentions this membrane as indicating a possible sexual origin for the sorus, but thinks Schroeter's explanation probably the correct one. This may also explain the empty membrane represented in fig. 6.

Some of the resting spores, in their earlier stages, show a pouch-like body closely adhering to the outer surface (fig. 9). It is barely possible that both sori and resting-spores result from the conjugation of the swarm-cells.

So far, all efforts to induce the resting-spores to germinate have been unsuccessful, and the writer is not able to state whether their contents first break up into sporangia, or pass directly into swarm-cells.—IDA CLENDENIN, *Baton Rouge, La.*

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[1] Schroeter, Krypt. Flora Schles. Pilze, 189.
[2] Fischer, Rabenhorst's Krypt. Flora von Deutschland, Œsterreich und der Schweiz. 1: Abthl. IV. 52.
[3] De Bary, Comp. Morphol. and Physiol. of Fungi. 168.

EXPLANATION OF PLATE XXVIII.—Fig. 1. Section through two pustules on stem of Stellaria media. × 105.—Fig. 2. Cross section of healthy stem. × 105.—Fig. 3. Cross section of receptacle and resting-spore, the latter emptied of its contents. × 425.—Fig. 4. Resting-spore with outer thick coat broken and showing the endosporium. × 425.—Fig. 5. Surface view of epidermis of diseased part. × 425.—Fig 6. Section through an upper internode, showing two sori in a common receptacle, one sorus emptied of sporangia. × 425.—Fig. 7. A larger sorus. ×425.—Fig. 8. Section through a younger pustule, showing an immature resting-spore or sorus. × 425.—Fig. 9. Young resting-spore with membrane attached to one side. × 425.

**A peculiar malformation of an ovary and placenta on Begonia rubra-grandiflora.**—Last spring while engaged in a series of cross fertilization experiments, I observed a very peculiar ovary and pistil in one of the flowers I had crossed. It was Begonia rubra-grandiflora and it had been fertilized by pollen from Begonia Verschafeltii with all the usual precautions against accidental fertilization from other sources. The ovary was superior instead of inferior, as it is normally. The four branches of the stigma seemed to be attached to the sides of the ovary near the base; or rather the ovary seemed to have grown up in the middle of the flower pushing the four branches of the stigma apart. The ovary also seemed to be turned wrong side out, exposing the parietal placenta on its outer surface, which was apparently covered with tiny whitish ovules. No capsule was developed below the base of the calyx, as in a normal pistillate blossom. These ovules or seeds could be seen very distinctly four or five days after fertilization, without a lens.

Unfortunately, after about ten days of growth, this peculiar ovary was accidentally broken off; but the stem was placed in water under a bell jar until the seeds became brown, and seemed ripe. Though the seeds seemed shrivelled when dry they were nevertheless planted; but none germinated.

This malformation was so curious (and so far as I could find unrecorded), that I would not trust my own observation, but showed the plant to several botanical students, and to Prof. A. S. Hitchcock, and Mr. M. A. Carleton, all of whom agreed with me that these small bodies on the outside of the ovary appeared to be seeds. Some were scraped off with a scalpel and examined under a microscope; and to all outward appearances seemed to be genuine seeds.

I have never read of a similar freak, so think this instance might be of interest to other botanists.—MINNIE REED, *Botanical Department, Kansas Agric. College, Manhattan.*